Historic American Engineering Record

SC-7

HAER,
SC,
4-SAVRI,
2-

GREGG SHOALS DAM AND POWER PLANT
LOWNDESVILLE VICINITY
ANDERSON COUNTY
SOUTH CAROLINA

PHOTOGRAPHS

Historic American Engineering Record
National Park Service
Department of Interior
Washington, D.C. 20243

HAER, SC, 4-SAVR1, 2-

HISTORIC AMERICAN ENGINEERING RECORD

GREGG SHOALS DAM AND POWER PLANT
HAER SC-7

Location:	Across Savannah River, County Road 35, 5.7 miles southwest of Highway 81, Lowndesville vicinity, Anderson County, South Carolina. UTM : 17.339480.3786900 QUAD: Lowndesville, S.C.-Ga.
Date of Construction:	1907
Present Owner:	U.S. Army Corps of Engineers Savannah District
Present Use:	None
Significance:	The Gregg Shoals Dam and Power Plant began operations in May 1907 and produced electricity until September 1954. It was among the early low-head hydroelectric plants in America and is associated historically with the major power companies in the southeastern U.S. Developed by the Savannah River Power Company, it was acquired by Georgia Power Company in 1912 and until 1954 was leased to the Southern Public Utilities Company, a subsidiary of Duke Power Company.
Historian:	John P. Johnson, September 1980.

THE GREGG SHOALS DAM AND POWER PLANT, SAVANNAH RIVER, 1907-1954

The archeological remains of the Gregg Shoals Dam are located across the Savannah River between Anderson County, South Carolina, and Elbert County, Georgia. The Gregg Shoals Power Plant began operations in May 1907, and produced electricity until September 1954. The Gregg Shoals Plant was among the early low-head hydroelectric plants built in America and it is associated historically with the major power producing companies in the southeastern United States. The concrete dam was breached in 1954, and the foundation of the power plant is located on the South Carolina bank of the river.

The Federal water power survey, conducted in 1880, was the catalyst for the simultaneous development of the textile and hydroelectric industries in the Piedmont regions of Georgia, South Carolina, and North Carolina. Based on the 1880 data collected by the nationally famous engineer George F. Swain, South Carolina published its first water power site survey in 1883. Georgia published a similar survey in 1895. The Columbia Canal was the first water power project in South Carolina for the purpose of selling electricity to cotton factories and municipal lighting and street railway companies.[1]

South Carolina's second hydroelectric project was undertaken by the Anderson Water, Light and Power Company in 1895. William C. Whitner built a small hydro plant at High Shoals on the Rocky River, six miles south of Anderson, South Carolina. Whitner's Plant supplied a small amount of electricity and demonstrated the feasibility of transmitting electricity over long distances.

Whitner's second project, completed in 1897, was the hydroelectric plant at Portman Shoals on the Seneca River. Portman Shoals Dam and Power Plant was located just above the confluence of the Seneca and the Tugalo Rivers where they form the Savannah River. The plant was in operation from 1897 until 1960 and is now covered by the Hartwell Reservoir. In 1898, electricity was transmitted 10 miles west to the industries in Anderson. For its early role in hydroelectric engineering Anderson became known as "The Electric City." Whitner's engineering partner on the Portman Shoals project was William S. Lee. Lee designed the electrically powered (direct current) Piedmont and Northern Railway in 1908 for James B. Duke.[2] Lee later became the first Chief Engineer for the Duke Power Company.

The first President of the Anderson Water, Light and Power Company was Dr. Samuel M. Orr, a prominent physician in Anderson. The idea for developing the Gregg Shoals site was suggested to Dr. Orr's son, Harry A. Orr, by O. H. Sheffield, a civil engineer from Atlanta. In August 1904, an act of the Georgia Legislature granted private parties the right to construct three dams across the Savannah River. O. H. Sheffield received the right to construct two dams on the river. One proposed site spanned the river from a point in Elbert County

near W. H. Mattox's Grist Mill to a point near the Seaboard Airline Railroad Bridge in Abbeville County, South Carolina. Sheffield was also given authority to develop the Gregg Shoals site, near the mouth of Pickens Creek in Elbert County. By this same Act, Granville Beal was authorized to construct a dam across the river at Trotter's Shoals (20 miles south of Gregg Shoals) in Elbert County. The dams were to be developed to produce power for commercial and manufacturing uses. Tbe Act also provided for fish-ladders to be built in conjunction with the dams.[3]

In January 1906, Dr. Orr announced that he would develop a hydroelectric plant at Gregg Shoals and that work would begin in one month for a concrete dam 12' at the base, 12' high and nearly 1,000' long. If the Gregg Shoals project proved successful, another dam would be built at Cherokee Shoals, 10 miles downstream.[4] Both plants, it was estimated, would generate approximately 9,000 HP.

The Savannah River Power Company was chartered January 23, 1906, by the South Carolina legislature. The officers of the corporation were Dr. S. M. Orr, H. H. Watkins of Anderson, and L. O. Peterson of Greenville. The other directors of the corporation were: electrical engineer Harry A. Orr, civil engineer Joseph E. Sirrine, and the turbine manufacturer C. Elmer Smith of York, Pennsylvania. Prior to developing Gregg Shoals Harry Orr[5] had been an engineer with the General Electric Company in Atlanta.

Joseph E. Sirrine was the principal engineer for the Gregg Shoals project. Sirrine began his career in 1895 by designing cotton factories while he was Director of the Southern Department in Greenville for the engineering firm of Lockwood Greene and Company of Boston, Massachusetts. In 1902, Sirrine started his own firm in Greenville and became an important factory and water power engineer in South Carolina. In the Gregg Shoals design, Sirrine incorporated the latest technology in low-head hydroelectric generation. C. Elmer Smith, a contractor, offered technical assistance in the installation of his company's newest turbine design. Smith was the son of S. Morgan Smith, founder of the famous water turbine company of York, Pennsylvania. S. Morgan Smith also developed the Atlanta Water and Electric Power Company, a predecessor to Georgia Power Company.[6]

The United States Congress ratified the development at Gregg Shoals on February 5, 1907. War Department approval, bowever, was not secured until August 1907. There was some local opposition to the construction of a dam that would inhibit the passage of fish and boats above Gregg Shoals on the Savannah River. The Savannah River was a navigable river and therefore under the jurisdiction of the War Department. On April 8, 1907, Colonel Dan C. Kingman of the Savannah District of the U. S. Army Corps of Engineers heard evidence for and against construction of the dam, fish-ladder, and a navigation lock at the site.[7]

John V. Stribling, representing some Anderson County interests, objected to the dam on the grounds that it would inundate valuable farmland above the shoals. Col. Kingman pointed out, however, that Georgia, South Carolina, and the U.S. Congress had already approved the dam construction. Col. Kingman favored the construction of a navigation lock. The Savannah River Power Company contended that the river above the shoals was not navigable and had not been for several years. Testimony was also presented that salmon had not been seen in that part of the river for over 25 years. The power company also contended that if the cost of installing a lock was imposed by the War Department, the entire project would probably fall through.

Most of the evidence submitted showed that a majority of the people residing in the affected counties favored building a dam. The fish-ladders were not deemed critical. A final decision was made on August 8, 1907, when the Secretary of War endorsed the construction of the dam without the navigation locks. However, the Government reserved the right to require the construction of a suitable lock, whenever navigation interests demanded it.[8]

Construction, meanwhile, proceeded at Gregg Shoals on the Savannah River, 18 miles south of the confluence of the Seneca and the Tugaloo Rivers, and electricity was first generated from the Gregg Shoals Power Plant on May 13, 1907. By May 23, the Anderson Traction Company began operating street cars with electricity from the plant instead of from the Portman Shoals Power Plant.[9] Total construction cost of the Gregg Shoals project was $333,294.84.

The gravity type dam was constructed of concrete with ashlar facing. The crest of the spillway was irregular and had a general height of 14' above low water at the toe of the dam. Flashboards 2' high were added soon after the original 12' construction to increase the amount of water impounded by the dam. The dam, anchored in bedrock in the Savannah River, was provided with five sluice gates in a special construction section (38' high) in the middle of the 920' structure.

The power house, on the South Carolina bank, was a 93' x 36' concrete and brick structure with a 38' interior height. The power house had a concrete and rubble foundation, a brick superstructure, and a wood frame roof on steel trusses. A 17' x 64' wood frame sash monitor projected 6' above the roof. A 23' x 15' tool house, 15' high of common brick with a concrete floor, was added to the east side of the main power house.

The hydroelectric machinery consisted of four horizontal units set in open flumes. Each unit consisted of five S. Morgan Smith turbines (750 HP) on the same shaft with direct connected Westinghouse generators (2,300 volts, 3 phase, 60 cycles).

A sub-station at the plant transmitted electricity to Anderson along a 22-mile transmission line. Another line transmitted power 27 miles to Abbeville and 4 miles to Greenwood. A separate power line connected to the cotton factory at Calhoun Falls, South Carolina.

Company housing was constructed on a ridge above the power house. A two-story wood-frame house with nine rooms was built for the Superintendent of the plant and a one-story wood-frame dwelling with three rooms was built for plant personnel. There were also several small barns and storage sheds on the site. Access to the site was on a private road leading from the main road to Anderson. There was no access from the Georgia bank. The pool created above the dam was a favorite fishing spot for local people and plant personnel. Boats were warned to stay clear of the spillway of the dam.[10]

During its operation from 1907 until 1954, the Gregg Shoals Power Plant provided electricity to Anderson, Abbeville, Greenwood, and Calhoun Falls, South Carolina. A transmission line also extended to Elberton, Georgia, and connected with the Georgia Railway and Power Company, later the Georgia Power Company.

In March 1912, the Georgia Railway and Power Company acquired the Gregg Shoals Power Plant. In 1913, a 20-year lease was made with the Anderson Water, Light and Power Company, which later became the Southern Public Utilities Company (S.P.U. Company), a subsidiary of the Duke Power Company. The hydro plant, transmission lines, and substations were leased for $27,000 annual rent. In 1932, the first 20-year lease was up for renewal and an extensive survey was made of the plant by O. S. Vogel of the Engineering Department of Georgia Power. A new maintenance agreement based on a realistic valuation of the plant and land was signed between Georgia Power and Duke Power. Output averaged about eight million KWH between 1920-1931. By this time, the S.P.U. Company had installed new headgates and a steel-guyed electric derrick on the head works. The derrick was used to clean trash from the forebay.

In January 1933, a 5-year lease for $25,000 annual rent was signed by Georgia Power and Duke Power. In March 1938, a 10-year lease for $15,000 annual rent was signed. The lease was renewed in December 1947 for $15,000 annual rent. In 1954, the lease was broken by mutual agreement.[12]

By 1954, the original 1,400 KWH capacity of the Gregg Shoals Power Plant had been diminished to 300 KWH and at times it produced only 100 KWH. A complete inspection of the system revealed that the generators were running too hot because of a lack of ventilation in the

lower part of the power house. Sand, flowing down the Savannah River, was also causing problems. Sand had silted above the dam and reduced the volume of water available since the original 1907 construction. In times of high water, sand entered the flumes and the turbine runners, occasionally stalling the turbines completely. There was no easy solution to the problem. The hydro technology was then 50 years old and correcting the problems would have required installing new turbines and completely rebuilding the plant to house them.[13]

Herman B. Wolf, Superintendent of Operations for Duke Power Company, inspected the plant and met with Georgia Power Engineers in Atlanta to discuss the situation. In June 1954, by mutual agreement, Georgia Power and Duke Power agreed to cancel the lease. Georgia Power resumed ownership of the facility and made the decision to abandon the plant as of September 1954. Sexton Brothers of Spartanburg, South Carolina, dismantled the plant and salvaged the machinery as scrap metal. The dam was breached in late 1954 or early 1955. The Gregg Shoals Power Plant had become a marginal facility compared to the larger developments of Georgia Power on the Tallulah and Tugaloo Rivers in northeast Georgia and Duke Power's developments in northwestern South Carolina.[14]

Footnotes and Bibliography

1. For recent survey of water-power development in the southeastern states see:

Hunter, Louis C. A History of Industrial Power in the United States, 1780-1930. Volume One: Waterpower in the Century of the Steam Engine. Charlottesville, VA.: University of Virginia Press, 1979.

U.S. Census Office, Tenth Census, Reports on the Water-Power of the United States, 2 Volumes, Washington, D.C., 1885-1887.

Butler, A.P. South Carolina. Resources and Population. Institutions and Industries. Charlestown, S.C.: Walker, Evans & Cogswell, Printers, 1883. Chapters VII and IX.

Nesbitt, R. T. Georgia, Her Resources & Possibilities, Atlanta: Franklin, 1895, p. 166.

Hall, B.M. A Preliminary Report on a Part of the Water-Powers of Georgia. Atlanta: Geological Survey of Georgia, Bulletin No. 3-A, 1896.

Hall, B.M. and M. R. Hall. Second Report on the Water Powers of Georgia. Atlanta: Geological Survey of Georgia, Bulletin No. 16, 1908.

Stevens, O. B. and R. F. Wright. Georgia Historical and Industrial. Atlanta: George W. Harrison, 1901.

Kohn, August. The Water Powers of South Carolina. Charleston, S.C.: State Department of Agriculture, Commerce and Industries, 1910. Chapter XXXI. "Gregg Shoals," XLVII. "Important Projects on the Savannah." XXV. "The Anderson Enterprise."

2. Dickson, F. A. Journeys into the Past: The Anderson Region's Heritage. Anderson, S.C.: Dickson, 1975.

Smith, R. M. Vandiver's History of Anderson County, rev. ed. 1970. Anderson, S.C.: S.C. Smith, 1970.

Horn, Carl Jr. The Duke Power Story, 1904-1973. New York: Newcomen Society in North America, 1973.

South Carolina, A Handbook. Columbia, S.C.: Department of Agriculture, Commerce & Industries and Clemson University College, 1927, "South Carolina Electrified" pp. 42-53.

3. Acts and Resolutions of the State of Georgia for 1904. Part II, Title 2, No. 577, PP. 266-267, "Elbert County, Dams Across Savannah River in, Authorized," Approved August 11, 1904.

4. Elberton Star, January 12, 1905; January 18, 1906; February 1, 18, 1906; January 30, 1907.

Abbeville Press and Banner, March 22, 1905; January 17, 23, 1906.

5. Watson, E. J. Handbook of South Carolina: Resources, Institutions & Industries of the State. Columbia, S.C.: State Department of Agriculture, Commerce & Immigration, 1907, Chapter VI, "Water Powers of South Carolina."

Savannah River Power Company, Charter Papers and Stock Holders Journal, January 29, 1906 - March 18, 1912. p. 33, "Construction Expenses" in collection of Georgia Power Company Archives, Atlanta.

Hemphill, J.C. Men of Mark in South Carolina. Washington: Men of Mark Publishing Company, 1909; S. M. Orr, Volume 4, pp. 284-286; H. H. Watkins, Volume 4, pp. 413-415; J. E. Sirrine, Volume 4, pp. 352-356.

6. Wright, Wade H. History of the Georgia Power Company 1855-1956. Atlanta: Georgia Power Company, 1957.

Smith, Beauchamp E. "S. Morgan Smith and the Hydro-Electric Industry." New York: Newcomen Society of North America, 1952.

7. House of Representatives Document No. 1934, 64th Congress, 2nd Session, January 13, 1917, Series 7148, "Letter from the Secretary of War . . . Examination and Survey of Savannah River at and above Augusta, Ga." Letter No. 23, p. 21.

Elberton Star, April 11, 1907.

8. Ibid.

9. Records of the Savannah River Power Company, see note 5. Elberton Star, May 2, 23, 1907.

10. "Report on Gregg Shoals Water Power Plant and Transmission Line Connections." Georgia Power Company, Engineering Department, October 1, 1932, Georgia Power Company Archives, Atlanta.

Hamm, Thomas B. From the Hills of Carolina: The Life of Thomas B. Hamm. Indian Rocks Beach, Fl.: Books Unlimited, 1970.

11. Ibid; Wright, W. H. History of Georgia Power Company.

12. Ibid.

13. Correspondence, W. H. Anderson, Manager Retiree Affairs, Duke Power Company to John P. Johnson, Historic American Engineering Record, August 13, 20, 1980; October 31, 1980. Correspondence, Herman B. Wolf, Pineville, N.C. to J.P.Johnson, HAER, August 21, 1980.

14. Wright, W. H. History of Georgia Power Company.

Horn, Carl, Jr. The Duke Power Story.

Saville, Thorndike. "The Power Situation in the Appalachian States" Manufacturers Record. Volume 91. 1927, pp. 68-77.

Electrical World. "Hydroelectric Development in Georgia." Volume 87, 1926, pp. 750-756.

Georgia Railway and Power Company. Industrial Georgia: Cotton Manufacturers. Atlanta: Georgia Railway and Power Co., 1923.

Independent Anderson. February 18, 1961.

Sumter Daily Item. March 30, 1960.

Addendum to
Gregg Shoals Dam and Hydroelectric Plant
Across Savannah River, County Road 35
Lowndesville vicinity
Anderson County
South Carolina

HAER No. SC-7

HAER
SC,
4-SAVR,
2-

PHOTOGRAPHS

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D.C. 20240